Claims

1. An electrolysis process for the recovery of metal from an aqueous solution wherein on electrolysing the solution metal is caused to deposit on a deposition surface of a cathode, the process including the step of

- inducing a non-uniform current density across the deposition surface so as to form areas of high current density interspaced by areas of low current density, the difference between the areas of high current density and low current density being sufficient to cause metal deposition to be concentrated on the areas of high current density so as to promote non-uniform deposition of metal across the deposition surface.

2. A process according to claim 1, wherein the areas of high current density and low current density extend along the surface in one direction and alternate across the surface in an opposite direction.

3. A process according to either claim 1 or claim 2 wherein the cell is operative to recover copper from the aqueous solution and the current density in the areas of high current density is in the range of 500-2500 A/m^2 and more preferably 1000 A/m^2.

4. A process according to any one of the preceding claims, wherein the cell is operative to recover copper from the aqueous solution and the current density in the areas of lower current density is in the range of 0-1250 A/m^2 and more preferably 0-500 A/m^2.

5. A process according to any one of the preceding claims, further including the step of removing deposited metal from the deposition surface by passing an element over said surface.

6. A process according to claim 5, where dependent on claim 2, wherein the element is moved in the direction in which the areas of high and low current density extend.

7. A process according to either claim 5 or 6, wherein deposited metal is removed by the element whilst maintaining current flow in the aqueous solution.

8. A process according to any one of claims 5 to 7, wherein the element is

moveable between first and second positions, and is operative to be passed over the deposition surface in either of the first and second positions.

9. A process according to claim 8, wherein when in its first position, the element is in contact with, or in close proximity to, the deposition surface so as to remove substantially all of the deposition material from that surface.

10. A process according to either claim 7 or 8, wherein when in its second position, the element is spaced from the deposition surface and is operative to engage and remove deposited material which extends a predetermined distance from the deposition surface.

11. An electrolysis cell for the electro-recovery of metal from an aqueous solution, the cell including a cathode which includes a deposition surface on which metal is deposited on electrolysing of the aqueous solution, wherein in operation of the cell, the deposition surface has a non-uniform electrical field having areas of strong electrical field interspaced by areas of weak electrical field, the difference between the areas of strong electrical field and weak electrical field being sufficient to cause metal deposition to be concentrated on the areas of high electrical field so as to promote non-uniform deposition of metal on the surface.

12. An electrolysis cell according to claim 11, wherein the areas of strong electrical field and weak electrical field extend along the surface in one direction and alternate across the surface in an opposite direction.

13. An electrolysis cell according to either claim 11 or 12, wherein the deposition surface of the cathode includes an array of alternate ridges and valleys, with the ridges forming the areas of strong electrical field and the valleys forming the areas of weak electrical field.

14. An electrolysis cell according to claim 13, wherein the cathode includes a sheet having at least one major surface which forms the deposition surface of the cathode, the sheet being preformed so as to incorporate the alternate ridges and valleys.

15. An electrolysis cell according to claim 14, wherein the sheet has opposite major surfaces, each of which forms a deposition surface of the cathode.

16. An electrolysis cell according to claim 15, wherein the sheet is folded so as to form the valleys and ridges on the opposite deposition surfaces with the ridges on one deposition surface being directly opposite the valleys on the opposite deposition surface and vice versa.

17. An electrolysis cell according to either claim 13 or 14, wherein the sheet is of generally uniform thickness.

18. An electrolysis cell according to any one of claims 14 to 17, wherein the sheet is formed from titanium.

19. An electrolysis cell according to claim 14, further including at least one conducting element which extends along the sheet, the conducting element being in electrocommunication with the sheet so as in use to supply the deposition surface with electrons in the electrolysis process.

20. An electrolysis cell according to claim 19, wherein the conducting element is of sufficient size to add rigidity to the sheet.

21. An electrolysis cell according to either claim 19 or 20, wherein the cathode ~~includes~~ a second sheet which is connected to the first sheet and which has a major surface which forms a second deposition surface of the cathode, the second sheet being preformed so as to incorporate the alternate ridges and valleys along the deposition surface.

22. An electrolysis cell according to claim 21, wherein the second sheet is connected to the first sheet of the cathode so as to form a plurality of pockets which extend in the direction of the alternate ridges and valleys, the pockets being operative to ~~receive~~ a conducting element of the cathode.

23. An electrolysis cell according to any one of claims 11 to 21, further including a ~~wiping~~ device which is operative to pass over the deposition surface of the cathode so as to remove deposited material from that deposition surface.

24. An electrolysis cell according to claim 23, when dependent on claim 13, wherein the wiping device includes a plurality of projections which are operative to locate within respective valleys of the deposition surface.

25. A cathode for use in an electrolysis cell for the electrorecovery of metal from an aqueous solution, the cathode having a deposition surface including an array of alternate ridges and valleys.

26. A mechanism for removing metal deposited onto the deposition surface of the cathode of claim 25, the mechanism including a plurality of elements arranged to project into respective valleys and be moved therealong so as to dislodge deposited metal from the ridges and valleys.

27. A mechanism as claimed in claim 26, wherein the elements have a shape generally corresponding to the valleys.

28. A mechanism as claimed in claim 26 or claim 27, wherein the elements are formed from a ceramic material.

29. A mechanism as claimed in any one of claims 26 to 28, wherein the elements are pivotally operable between a first position in which the elements protrude into the valleys and a second position in which the elements do not so protrude.

30. An electrolysis process substantially herein as described with reference to the accompanying drawings.

31. An electrolysis cell substantially herein as described with reference to the accompanying drawings.

32. A cathode substantially herein as described with reference to the accompanying drawings.

33. A mechanism for removing metal deposited onto a cathode substantially as herein described with reference to the accompanying drawings.